

## IT IS CLAIMED:

1. A method of determining the relative amounts of individual polynucleotides in a mixture of different-sequence polynucleotides, comprising
- 5 labeling the polynucleotides with a fluorescent reporter, to form a mixture of labeled polynucleotides, contacting the labeled polynucleotides, under hybridization conditions, with a microarray of different
- 10 DNA sequences disposed at discrete locations a non-porous surface, at a density of at least about 100 locations/cm<sup>2</sup>, where the different DNA sequences in the array are each (i) present in multiple copies, and (ii) effective to hybridize to individual polynucleotides in the mixture,
- 15 and
- determining the level of fluorescence at each position in the microarray.
2. The method of claim 1, wherein said contacting includes covering the array surface with a solution of
- 20 the mixture of labeled polynucleotides, to a solution depth of less than 500 microns.
3. The method of claim 1, wherein the DNA sequences
- 25 in the array are at least about 50 bases in length.
4. The method of claim 1, wherein the labeled polynucleotides represent at least 1 million unique base sequences.
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5. The method of claim 1, wherein the density of array elements corresponding to different-sequence DNA locations in the array is at least 1,000/cm<sup>2</sup>.

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a2  
 a3  
 b4  
 c4a  
 c5